CLAIMS

What is claimed is:

1. An apparatus for optical navigation comprising:

a surface comprising an aperture, said surface configured to be moveable against an illuminated surface having a detectable texture;

an optical motion detection circuit integral to said apparatus and optically coupled to said detectable texture of said illuminated surface, said optical motion detection circuit producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface, wherein said optical motion detection circuit is operable to detect said detectable texture without requiring an integral illumination source.

2. The apparatus as recited in Claim 1 further comprising an optical element integral to said apparatus, said optical element proximate said aperture and receiving light from said detectable texture of said illuminated surface, said optical element operable to optically couple said optical motion detection circuit integral to said detectable texture of said illuminated surface.

3. The apparatus as recited in Claim 1 further comprising:

an internal interference reduction light source integral to said apparatus and proximate said aperture, said interference reduction light source operable to provide interference reducing illumination onto said illuminated surface in response to said optical motion detection circuit detecting interference caused by said illumination; and

an optical filter operable to filter said illumination and receive said interference reducing illumination such that said optical motion detection circuit can detect said detectable texture in the event of interference caused by said illumination.

4. The apparatus as recited in Claim 1 further comprising a supplemental light source operable to provide additional illumination onto said illuminated surface in response to said optical motion detection circuit detecting insufficient illumination of said illuminated surface.

5. The apparatus as recited in Claim 1 further comprising an internal power source for providing power to said apparatus.

6. The apparatus as recited in Claim 1 wherein said illuminated surface is a cathode ray tube and wherein said detectable texture is a shadow mask of said cathode ray tube.

7. The apparatus as recited in Claim 1 wherein said illuminated surface is a liquid crystal display and wherein said detectable texture is a diffuser plate of said liquid crystal display.

8. The apparatus as recited in Claim 1 wherein said illuminated surface is a liquid crystal display and wherein said detectable texture comprises pixels of said liquid crystal display.

9. The apparatus as recited in Claim 1 wherein said illuminated surface is overlaid with a semi-transparent layer comprising said detectable texture.

10. The apparatus as recited in Claim 9 wherein said semi-transparent layer comprises unique positioning information providing absolute position information of said apparatus relative to said illuminated surface.

11. An electronic device for optical navigation on a display screen, said electronic device comprising:

a surface comprising an aperture, said surface configured to be moveable against a display screen having a detectable texture when illuminated;

an optical element integral to said electronic device, said optical element proximate said aperture and receiving light from said detectable texture when illuminated; and

an optical motion detection circuit integral to said electronic device and optically coupled by said optical element to said detectable texture of said display screen, said optical motion detection circuit producing motion signals indicative of motion of said surface relative to said detectable texture of said display screen when illuminated, wherein said optical motion detection circuit is operable to detect said detectable texture without requiring an integral illumination source.

12. The electronic device for optical navigation on a display screen as recited in Claim 11 further comprising:

a supplemental light source integral to said electronic device and proximate said aperture, said supplemental light source operable to provide additional illumination onto said display screen in response to said optical motion detection circuit detecting insufficient illumination of said display screen and operable to provide interference reducing illumination onto said display screen in response to said optical motion detection circuit detecting interference caused by said illumination; and

an optical filter operable to filter said illumination and receive said interference reducing illumination such that said optical motion detection circuit can detect said detectable texture in the event of interference caused by said illumination.

13. The electronic device for optical navigation on a display screen as recited in Claim 11 further comprising an integral power source for providing power to said electronic device.

14. The electronic device for optical navigation on a display screen as recited in Claim 11 wherein said detectable texture is a shadow mask of a cathode ray tube.

15. The electronic device for optical navigation on a display screen as recited in Claim 11 wherein said detectable texture is a diffuser plate of a liquid crystal display.

16. The electronic device for optical navigation on a display screen as recited in Claim 11 wherein said detectable texture are pixels of a liquid crystal display.

17. The electronic device for optical navigation on a display screen as recited in Claim 11 wherein said display screen is overlaid with a semi-transparent layer comprising said detectable texture.

18. The electronic device for optical navigation on a display screen as recited in Claim 17 wherein said semi-transparent layer comprises unique positioning information providing absolute position information of said electronic device relative to said display screen.

19. A method for optical navigation on an illuminated surface using an electronic device, said method comprising:

acquiring a first frame from said illuminated surface such that said electronic device does not require an internal illumination source to provide illumination to said illuminated surface;

acquiring a second frame from said illuminated surface;

determining a change in position of said electronic device relative to said illuminated surface based on said first frame and said second frame.

20. The method as recited in Claim 19 wherein said determining a change in position comprises:

computing correlation values for said first frame and said second frame, said correlation values indicating movement of said electronic device from said first frame to said second frame;

predicting a shift in position from said first frame based on said correlation values; and

outputting a motion signal indicating said shift in position.

21. The method as recited in Claim 20 further comprising:

determining whether illumination provided by said illuminated surface sufficient for said acquiring said first frame; and

provided said illumination provided by said illuminated surface is not sufficient for said acquiring said first frame, providing additional illumination onto said illuminated surface.

22. The method as recited in Claim 20 further comprising:

determining whether illumination provided by said illuminated surface interferes with said acquiring said first frame; and

provided said illumination provided by said illuminated surface interferes with said acquiring said first frame, providing interference reducing illumination onto said illuminated surface; and

filtering said illumination such that said electronic device can acquire said first frame using said interference reducing illumination.